IN THE CLAIMS:

Please cancel Claim 20 without prejudice or disclaimer of subject matter. The claims, as pending in the subject application, now read as follows:

1. (Previously presented) A decoding method of decoding encoded image data which has been hierarchically encoded in advance by a discrete wavelet transform method, comprising:

determining a size of an image to be outputted;

decoding the encoded image data up to a layer of hierarchy which is one or more layers higher than a minimum number of layer/layers of hierarchy needed by an image to be equal to or exceed the determined size when image data is decoded to the minimum number of layer/layers of hierarchy; and

reducing the size of the decoded image to the determined size.

2. (Previously presented) The decoding method according to claim 1, wherein said decoding includes:

determining the minimum number of layer/layers of hierarchy needed by the image to be equal to or exceed the determined size when image data is decoded to the minimum number of layer/layers of hierarchy; and

decoding the encoded image data up to a layer of hierarchy which is one or more layers higher than the determined minimum number of layer/layers of hierarchy.

3. (Previously presented) The decoding method according to claim 1, wherein said decoding includes:

determining a layer/layers of hierarchy each of which, when the encoded image data is decoded up to each layer, makes a size of a decoded image exceed the determined size; and

decoding the encoded image data up to a layer of hierarchy which is one layer more than the lowest of the determined layer/layers.

4. (Original) The decoding method according to claim 1, wherein said decoding includes:

decoding a lowest layer of hierarchy of encoded image data among layer/layers which has/have not been decoded, comparing a size of an image obtained by decoding the encoded image data and the determined size, and repeating the decoding of a lowest layer of hierarchy of the encoded image data among the layer/layers which has/have not been decoded when the size of the decoded image is smaller than the determined size; and

decoding a next lowest layer of hierarchy of the encoded image data.

5. (Previously presented) The decoding method according to claim 1, wherein said decoding includes:

acquiring a layer of hierarchy which is one layer more than a minimum number of layer/layers of hierarchy needed by an image to be equal to or exceed the determined size when image data is decoded to the minimum number of layer/layers of hierarchy using a look up table

on the basis of a size of an image to be obtained by decoding all of the encoded image data and the determined image size; and

decoding the encoded image data up to the acquired layer of hierarchy.

6. (Canceled)

7. (Original) The decoding method according to claim 1, further comprising determining whether the minimum number of layer/layers of hierarchy corresponds to all the layers of hierarchy of the encoded image data,

wherein if the determination proves true, all the layers of hierarchy of the encoded image data are decoded.

8. (Original) The decoding method according to claim 1, wherein the determined size includes horizontal pixel number information and vertical pixel number information.

9. (Canceled)

10. (Original) The decoding method according to claim 1, wherein an encoding method used conforms to JPEG2000.

11. (Previously presented) A decoding apparatus for decoding encoded image data which has been hierarchically encoded in advance, comprising:

a determination unit that determines a size of an image to be outputted;

a decoding unit that decodes the encoded image data up to a layer of hierarchy which is one or more layers higher than a minimum number of layer/layers of hierarchy needed by an image to be equal to or exceed the determined size when image data is decoded to the minimum number of layer/layers of hierarchy; and

a reduction unit that reduces the size of the decoded image to the determined size.

12. (Original) A storage medium, readable by an information processing apparatus, storing a program including program codes capable of realizing the decoding method according to claim 1, the program being executable by the information processing apparatus.

13. (Previously presented) An encoding method of hierarchically encoding an image by a discrete wavelet transform method, comprising:

determining a size of an image to be outputted; and

encoding the image up to a layer of hierarchy which is one or more layers higher than a minimum number of layer/layers of hierarchy needed by an image to be equal to or exceed the determined size.

14. (Previously presented) The encoding method according to claim 13, wherein said encoding includes:

determining the minimum number of layer/layers of hierarchy needed by an image to be equal to or exceed the determined size; and

encoding the image up to a layer of hierarchy which is one layer more than the determined minimum number of layer/layers of hierarchy.

15. (Previously presented) The encoding method according to claim 13, wherein said encoding includes:

determining a layer/layers of hierarchy each of which, when the image is encoded up to each layer, makes a size of an encoded image exceed the determined size; and

encoding the image up to a layer of hierarchy which is one layer more than the lowest of the determined layer/layers.

16. (Original) The encoding method according to claim 13, wherein said encoding includes:

encoding a lowest layer of hierarchy of an image among layer/layers which has/have not been encoded, comparing a size of an encoded image and the determined size, and repeating encoding of a lowest layer of hierarchy of the image among the layer/layers which has/have not decoded when the size of the encoded image is smaller than the determined size; and

encoding a next lowest layer of hierarchy of the image.

17. (Previously presented) The encoding method according to claim 13, wherein said encoding includes:

acquiring a layer of hierarchy which is one or more layers higher than a minimum number of layer/layers of hierarchy needed by an encoded image to be equal to or exceed the determined size using a look up table on the basis of a size of the image and the determined image size; and

encoding the image up to the acquired layer of hierarchy.

18. (Original) The encoding method according to claim 13, further comprising determining whether the minimum number of layer/layers of hierarchy corresponds to all the layers of hierarchy to which the image data can be encoded,

wherein if the determination proves true, the image are encoded up to the possible layer.

19. (Original) The encoding method according to claim 13, wherein the determined size includes horizontal pixel number information and vertical pixel number information.

20. (Canceled)

21. (Original) The encoding method according to claim 13, wherein an encoding method conforms to JPEG2000.

22. (Previously presented) An encoding apparatus for hierarchically encoding an image, comprising:

a determination unit that determines a size of an image to be outputted; and

an encoding unit that encodes the image up to a layer of hierarchy which is one or more layers higher than a minimum number of layer/layers of hierarchy needed by an image to be equal to or exceed the determined size.

23. (Original) A storage medium, readable by an information processing apparatus, storing a program including program codes capable of realizing the encoding method according to claim 13, the program being executable by the information processing apparatus.

24. (Previously presented) An encoding method of hierarchically encoding an image by a discrete wavelet transform method or by using an orthogonal mirror filter, comprising:

restraining a frequency component which causes alias of an image signal of the image in advance of separating the image signal into layers of hierarchy; and

separating the restrained image signal into layers of hierarchy using a hierarchy separation filter.

25. (Original) The encoding method according to claim 24, wherein said restraining includes:

restraining a high frequency component of the input image signal; and

restraining a low frequency component of the input image signal.

26. (Original) The encoding method according to claim 25, wherein a low pass filter is used in said restraining of the high frequency component, and an output from said low pass filter is subtracted from the input image signal in said restraining of the low frequency component.

27. (Original) The encoding method according to claim 25, wherein a high pass filter is used in said restraining of the low frequency component, and an output from the high pass filter is subtracted from the input image signal in said restraining of the high frequency component.

28. (Original) The encoding method according to claim 25, wherein a low pass filter is used in said restraining of the high frequency component, and a high pass filter is used in said restraining of the low frequency component.

29. (Original) The encoding method according to claim 25, repeating said restraining and said separating for an image signal obtained by separating the image signal whose high frequency component is restrained.

30. (Original) The encoding method according to claim 26, wherein a filter is used in said separating, and a passband of the low pass filter is narrower than a passband of the filter used in said separating.

31. (Original) The encoding method according to claim 28, wherein a filter is used in said separating, and a passband of the low pass filter is narrower than a passband of the filter used in said separating.

32. (Original) The encoding method according to claim 27, wherein a filter is used in said separating, and a passband of the high pass filter is narrower than a passband of the filter used in said separating.

33. (Original) The encoding method according to claim 28, wherein a filter is used in said separating, and a passband of the high pass filter is narrower than a passband of the filter used in said separating.

34. (Original) The encoding method according to claim 25, wherein in said restraining of a high frequency component and a low frequency component, at least either one of a horizontal component and a vertical component of the image signal is restrained.

35. and 36. (Canceled)

37. (Original) The encoding method according to claim 24, wherein an encoding method conforms to JPEG2000.

38. (Previously presented) An encoding apparatus for hierarchically encoding an image by a discrete wavelet transform method or by using an orthogonal mirror filter, comprising:

a frequency restraining unit that restrains a frequency component which causes alias of an image signal of the image in advance of separating the image signal into layers of hierarchy; and

a separating unit that separates the image signal restrained by said frequency restraining unit into layers of hierarchy using a hierarchy separation filter.

39. (Original) The encoding apparatus according to claim 38, wherein said frequency restraining unit comprises:

a first restraining unit which restrains a high frequency component of the input image signal; and

a second restraining unit that restrains a low frequency component of the input image signal.

40. (Original) The encoding apparatus according to claim 39, wherein said first restraining unit is a low pass filter, and said second restraining unit is a subtractor which subtracts the image signal restrained by said first restraining unit from the input image signal.

41. (Original) The encoding apparatus according to claim 39, wherein said second restraining unit is a high pass filter, and said first restraining unit is a subtractor which subtracts the image signal restrained by said second restraining unit from the input image signal.

42. (Original) The encoding apparatus according to claim 39, wherein said first restraining unit is a low pass filter, and said second restraining unit is a high pass filter.

43. (Original) The encoding apparatus according to claim 39, wherein said frequency restraining unit and said separating unit recursively perform processes on an image signal obtained by separating by said separating unit the image signal restrained by said first restraining unit.

44. (Original) The encoding apparatus according to claim 40, wherein said separating unit includes a filter, and a passband of the low pass filter is narrower than the passband of the filter of the separating unit.

45. (Original) The encoding apparatus according to claim 42, wherein said separating unit includes a filter, and a passband of the low pass filter is narrower than the passband of the filter of the separating unit.

46. (Original) The encoding apparatus according to claim 41, wherein said separating unit includes a filter, and a passband of the high pass filter is narrower than the passband of the filter of the separating unit.

47. (Original) The encoding apparatus according to claim 41, wherein said separating unit includes a filter, and a passband of the high pass filter is narrower than the passband of the filter of the separating unit.

48. (Original) The encoding method according to claim 39, wherein said first and second restraining unit restrain at least either one of a horizontal component and a vertical component of the image.

49. and 50. (Canceled)

51. (Original) The encoding apparatus according to claim 38, wherein an encoding method conforms to JPEG2000.

52. (Original) A storage medium, readable by an information processing apparatus, storing a program including program codes capable of realizing the encoding method according to claim 24, the program being executable by the information processing apparatus.

53. (Previously presented) A decoding method of decoding encoded image data which has been hierarchically encoded in advance by a discrete wavelet transform method, comprising:

determining a layer of hierarchy up to which the encoded image data is to be decoded;

decoding the encoded image data up to the determined layer;

judging whether or not the determined layer corresponds to the highest layer of hierarchy of the encoded image data; and

restraining, when the determined layer does not correspond to the highest layer, a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy alias, of the decoded image data.

54. (Previously presented) A decoding method of decoding encoded image data which has been hierarchically encoded in advance by a discrete wavelet transform method, comprising:

decoding all of the encoded image data;

judging whether or not the encoded image data was obtained as a result of encoding all layers of hierarchy; and

restraining, when all the layers of hierarchy have not been encoded, a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy, of the decoded image data.

55. (Previously presented) A decoding method of decoding encoded image data which has been hierarchically encoded in advance by a discrete wavelet transform method, comprising:

inputting encoded image data from external;

determining a layer of hierarchy up to which the encoded image data is to be decoded;

decoding the encoded image data up to the determined layer;

judging whether or not all layers of hierarchy of the encoded image data have been decoded; and

restraining, when all the layers of hierarchy have not been decoded, a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy, of the decoded image data.

56. (Original) The decoding method according to claim 53, wherein a low pass filter is used in said restraining.

57. (Original) The decoding method according to claim 54, wherein a low pass filter is used in said restraining.

58. (Original) The decoding method according to claim 55, wherein a low pass filter is used in said restraining.

59. (Original) The decoding method according to claim 53, wherein in said restraining, at least a horizontal component or a vertical component is restrained.

60. (Original) The decoding method according to claim 54, wherein in said restraining, at least a horizontal component or a vertical component is restrained.

61. (Original) The decoding method according to claim 55, wherein in said restraining, at least a horizontal component or a vertical component is restrained.

62. to 64. (Canceled)

65. (Original) The decoding method according to claim 53, wherein an encoding method conforms to JPEG2000.

66. (Original) The decoding method according to claim 54, wherein an encoding method conforms to JPEG2000.

67. (Original) The decoding method according to claim 55, wherein an encoding method conforms to JPEG2000.

68. (Previously presented) A decoding apparatus for decoding encoded image data which has been hierarchically encoded in advance by a discrete wavelet transform method, comprising:

a determination unit that determines a layer of hierarchy up to which the encoded image data is to be decoded;

a decoder which decodes the encoded image data up to the determined layer;

a judging unit that judges whether or not the determined layer corresponds to the highest layer of hierarchy of the encoded image data; and

a restraining unit that restrains, when the determined hierarchy does not corresponds to the highest layer, a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy, of the decoded image data.

69. (Previously presented) A decoding apparatus for decoding encoded image data which has been hierarchically encoded in advance by a discrete wavelet transform method, comprising:

a decoder that decodes all of the encoded image data;

a judging unit which judges whether or not the encoded image data was obtained as a result of encoding all layers of hierarchy; and

a restraining unit that restrains, when all the layers of hierarchy have not been encoded, a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy, of the decoded image data.

70. (Previously presented) A decoding apparatus for decoding encoded image data which has been hierarchically encoded in advance by a discrete wavelet transform method, comprising:

an input unit that inputs encoded image data from external;

a determination unit that determines a layer of hierarchy up to which the encoded image data is to be decoded;

a decoder that decodes the encoded image data up to the determined layer;

a judging unit that judges whether or not all layers of hierarchy of the encoded image data have been decoded; and

a restraining unit that restrains, when all the layers of hierarchy have not been decoded, a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy, of the decoded image data.

71. (Original) The decoding apparatus according to claim 68, wherein said restraining unit uses a low pass filter.

72. (Original) The decoding apparatus according to claim 69, wherein said restraining unit uses a low pass filter.

73. (Original) The decoding apparatus according to claim 70, wherein said restraining unit uses a low pass filter.

74. (Original) The decoding apparatus according to claim 68, wherein said restraining unit restrains at least a horizontal component or a vertical component.

75. (Original) The decoding apparatus according to claim 69, wherein said restraining unit restrains at least a horizontal component or a vertical component.

76. (Original) The decoding apparatus according to claim 70, wherein said restraining unit restrains at least a horizontal component or a vertical component.

77. to 79. (Canceled)

80. (Original) The decoding apparatus according to claim 68, wherein an encoding method conforms to JPEG2000.

81. (Original) The decoding apparatus according to claim 69, wherein an encoding method conforms to JPEG2000.

82. (Original) The decoding apparatus according to claim 70, wherein an encoding method conforms to JPEG2000.

83. (Original) A storage medium, readable by an information processing apparatus, storing a program including program codes capable of realizing the decoding method according to claim 53, the program being executable by the information processing apparatus.

84. (Original) A storage medium, readable by an information processing apparatus, storing a program including program codes capable of realizing the decoding method according to claim 54, the program being executable by the information processing apparatus.

85. (Original) A storage medium, readable by an information processing apparatus, storing a program including program codes capable of realizing the decoding method according to claim 55, the program being executable by the information processing apparatus.